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US Army Corps of Engineers Detroit District

Great Lakes Update

Great Lakes Information Available on the Detroit District Website

The Great Lakes Hydraulics and Hydrology Office (H & H) in the Detroit District of the U.S. Army Corps of Engineers has the unique mission of monitoring hydrologic conditions across the Great Lakes basin (figure 1). From current water level reports and forecasts to precipitation and evaporation totals, many of the most visible products in the Detroit District originate in the H & H office and are readily available for viewing or downloading on a convenient website. Some of these products have been updated and improved in recent years and the focus of this article is to highlight several of the forecasts, data sources and reports located on the H & H website, which is located here:

http://www.lre.usace.army.mil/glhh

Figure 1: The Great Lakes Basin

Great Lakes Water Levels

One of the more popular items on the website is the current water level reports for the Great Lakes. These reports are usually updated by 11:00 AM eastern time and can be accessed here:

http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels/currentconditions/

These reports, both in English and metric units, show the individual water level gage data as well as the daily lake-wide mean water level. While each Great Lake has several water level gages to measure surface elevation, not all gages are used to compute a lake-wide mean. The gages used to on each lake were selected based on their periods of record and the quality of their data and are operated and maintained by the National Ocean Service in the U.S. and Canadian Hydrographic Service in Canada. The daily lake-wide mean water level is the average of the individual gage data for that particular day. The monthly mean water level is the average of all of the daily lake-wide mean values.

The network of water level gages has been used to calculate the lake-wide mean since the early 1990s. Prior to using a network of gages, a single master gage on each lake was used. The master gage would only report a water level at a single

location and not necessarily a level representative of the entire lake surface.

For water level recording and forecasting purposes, the Detroit District refers to Lake Michigan and Lake Huron as one lake hydraulically, due to their union at the deep Straits of Mackinac.

Other data located on this page include the water level reports for the three previous months, current water levels in the connecting channels (St. Marys, St, Clair, Detroit River, Niagara and St. Lawrence Rivers) and links to a number of other sites with Great Lakes basin conditions.

A user is also able to download coordinated monthly mean water levels back to 1918. Historic water level information can be accessed here:

http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels/historicdata/greatlakeshydrographs/

The official water level statistics, including monthly mean, record high and low and annual means can be downloaded here:

http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels/historicdata/longtermaveragemin-maxwaterlevels/

Water Level Forecasts, Update Articles and Monthly Summaries

The Detroit District has been forecasting Great Lakes water levels since the early 1950s. The three forecasts provided by the H & H office are based on current hydrologic and meteorological conditions in the Great Lakes basin and use a suite of statistical models to project water levels and the total supply of water to the lakes. All of our forecasts can be accessed here:

http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels/waterlevelforecasts/

The longest running and most subscribed to of our forecasts is the *Monthly Bulletin of Lakes Levels for the Great Lakes*. Issued once a month, the Monthly Bulletin forecasts monthly mean water levels for the next six months and shows actual monthly mean water levels from the past eighteen to twenty-four months. The Monthly Bulletin is usually posted within the first few days of the month and can be viewed here:

http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels/waterlevelforecasts/monthlybulletinofgreatlakeswaterlevels/

Users of the site are able to download, view and print the eleven by seventeen inch color version of the Bulletin containing all five lakes, or a full one page color version of a single lake, on and eight and half by eleven page.

Also on this page is a look at recent precipitation and water supply information across the Great Lakes basin and a guide to reading and understanding the Monthly Bulletin.

Update articles like this one accompany the Bulletin in January, April, July and October. These informational articles highlight many projects or points of interest across the Great Lakes Basin. Recent topics include Great Lakes diversions and the 100th anniversary of the Boundary Waters Treaty of 1909. The January version of the Update is a summary of the prior year's conditions in the Great Lakes basin. The archive of Update Articles dates back to the mid 1980s and can be accessed here:

http://www.lre.usace.army.mil/greatlakes/hh/newsandinformation/pastupdatearticles/

Following the posting of the Bulletin, a summary of water levels, precipitation and the forecast is

also compiled and made available on the internet. The current month's summary and twelve months of archived summaries are found here: http://www.lre.usace.army.mil/greatlakes/hh/newsandinformation/

The *Weekly Great Lakes Water Level Update* is done each Thursday and highlights recent conditions across the Great Lakes basin. Weather conditions, water levels and river flows are presented in a number of paragraphs with a table of water level comparisons toward the bottom of the page. This forecast can be viewed at the following link.

http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels/waterlevelforecasts/weeklygreatlakeswaterlevels/

One other forecast done by the Detroit District is the *Connecting Channels Water Levels and Depths*. This product is a bi-monthly forecast for locations along the St. Marys, St. Clair, Detroit and St. Lawrence Rivers and is usually posted on the third and the fifteenth of each month. The Connecting Channels Forecast projects water levels as a difference from Chart Datum and can be viewed here:

http://www.lre.usace.army.mil/greatlakes/hh/greatlakeswaterlevels/waterlevelforecasts/connectingchannelsforecasts/

All of the Detroit District's forecasts are available via subscription. The Monthly Bulletin and Connecting Channels Forecast can be mailed via the United States Postal Service or emailed as part of an online service, while the Weekly Forecast is only available online. If you are interested in subscribing to any of these products or changing your current subscription information please send an email to hhpm@usace.army.mil or call 1-888-694-8313 and select option one.

Great Lakes Weather and Snow Data

Another mission of the H & H Office is the monitoring of precipitation and snowpack conditions across the Great Lakes basin.

Precipitation and the runoff from melting snow are the largest contributors to the water supply of the Great Lakes. The magnitudes of the seasonal rises in water levels of the Great Lakes are often directly attributable to above or below average precipitation and runoff amounts.

If an above average snowpack combines with above average precipitation during the spring, lake levels will tend to rise quicker and higher than dry conditions with little snowpack. Heavy rain can also cause sharp increases in water levels at times when the lakes are in their period of seasonal decline. The current month's daily precipitation totals, the prior month's totals and an outlook for the coming month can be viewed by visiting this link:

http://www.lre.usace.army.mil/hh/precip.html

Snow pack graphics back to 1997 can be viewed on the Weather Information page, located here:

http://www.lre.usace.army.mil/greatlakes/hh/weatherinformation/

The monthly precipitation statistics from 1900-2006, modeled evaporation data and links to other weather related sites can also be viewed on the Weather Information page.

Other Great Lakes Information

The International Joint Commission (IJC) is the joint U.S. and Canadian entity, established by the Boundary Waters Treaty of 1909, to oversee issues relating to water use across the U.S. and Canadian border. Orders of Approval issued by the IJC allow for the regulation of the Lake

Superior outflow into the St. Marys River, the flow of water over Niagara Falls and the outflow from Lake Ontario into the St. Lawrence River. International control boards were also formed as a result of these orders. These boards are made up of a number of stakeholders on the U.S. and Canadian sides of the border. They ensure the regulation plans are followed and host regular meetings with the public. Current outflow strategies, board members and recent meeting materials can be viewed at each Board of Control website accessed here:

http://www.lre.usace.army.mil/greatlakes/hh/links

The Coordinating Committee on Great Lakes Basic Hydraulic and Hydrology Data serves in an advisory capacity to the agencies of the United States and Canada who are charged with the responsibility for collecting and compiling the Great Lakes hydraulic and hydrologic data.

The Coordinating Committee has led to an excellent working arrangement between agencies in the two countries and great management of the key resources of the Great Lakes basin. While the objectives of the Committee have experienced small changes over the years, the Committee's existence for over 50 years is a testament to necessity, acceptance and cooperation. The link to the Committee's website can also accessed via the above page.

Other links of interest available on this page include ones to the Buffalo and Chicago Corps of Engineers Districts and the Great Lakes Information Network (GLIN).

Lake Winnebago

Another important mission of the H & H Office is the regulation of Lake Winnebago in Wisconsin. Part of the Fox-Wolf River system (Figure 2), the Lake Winnebago pool is regulated by two dams; one being a federally owned dam in Menasha, WI and the other a private dam in Neenah, WI. Constant monitoring of conditions across the Winnebago basin is important to maintain the lake within its recognized range. Water levels in the Fox-Wolf River system are important to recreational boaters, habitat, municipal use and industry. Current condition reports, regulation strategy notices, meeting minutes and other excellent information can be found at the Lake Winnebago website located here:

http://www.lre.usace.army.mil/greatlakes/hh/lakewinnebago/

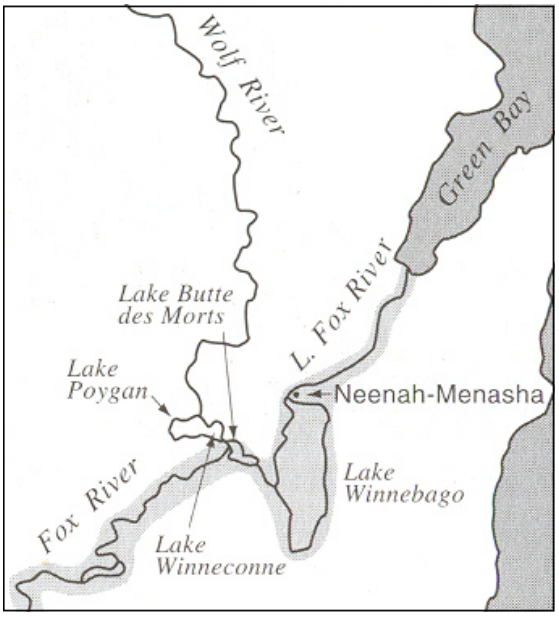

Figure 2: The Fox-Wolf River System

The Detroit District's Great Lakes Hydraulics and Hydrology Office welcomes comments on all of our products. Please email questions or comments to hhpm@usace.army.mil. To contact the office by phone call toll free 1-888-694- 8313 and select option one. The Detroit District's mailing address is:

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